

IN THE CLAIMS:

1. (Original) A disk drive comprising:

actuator means for positioning a head relative to a disk;

driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;

disturbance estimation means for estimating a magnitude of a disturbance applied to the head from a driving signal for the driving means and the voltage signal, and for generating a disturbance estimation signal;

position detection means for generating a position error signal corresponding to a current position of the head from servo information recorded on the disk in advance and detected by the head;

position control means for generating a position control means corresponding to the position error signal; and

correction means for combining the position control signal with the disturbance estimation signal to obtain the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal; and

addition means for adding a signal obtained by multiplying an integral signal obtained by integrating the deviation signal, by a first coefficient and a signal obtained

by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and for generating the disturbance estimation signal.

2. (Original) The disk drive according to claim 1, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage detection means;

first multiplication means for multiplying the driving signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

3. (Original) The disk drive according to claim 1, wherein a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_0^2/(\omega_0^2 - \omega_d^2)$,

where ω_0 is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

4. (Original) The disk drive according to claim 1, wherein

a control band of the disturbance estimation means is set wider than a control band of the position control means.

5. (Currently Amended) ~~[[A]]~~ The disk drive according to claim 1 comprising:

~~actuator means for positioning a head relative to a disk;~~
~~driving means for driving the actuator means;~~
~~voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;~~
~~disturbance estimation means for estimating a magnitude of a disturbance applied to the head from a driving signal for the driving means and the voltage signal, and for generating a disturbance estimation signal;~~
~~position detection means for generating a position error signal corresponding to a current position of the head from servo information recorded on the disk in advance and detected by the head;~~
~~position control means for generating a position control means corresponding to the position error signal; and~~
~~correction means for combining the position control signal with the disturbance estimation signal to generate the driving signal, wherein~~
the disturbance estimation means further comprises:

~~comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal;~~

filter means for cutting off a high frequency component of a proportional signal proportional to the deviation signal, and for generating a filter output signal; [[and]]
wherein

~~addition means for adding~~ the addition means adds a signal obtained by multiplying an integral signal, obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying the filter output signal by a second coefficient, and ~~for generating~~ generates the disturbance estimation signal.

6. (Original) The disk drive according to claim 5, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage detection means;

first multiplication means for multiplying the driving signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

7. (Original) The disk drive according to claim 5, wherein

a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$ where ω_o is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

8. (Original) The disk drive according to claim 5, wherein a control band of the disturbance estimation means is set wider than a control band of the position control means.

9. (Withdrawn) A disk drive comprising:

actuator means for positioning a head relative to a disk;

driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;

position detection means for generating a position error signal corresponding to a current position of the head from servo information recorded on the disk in advance and detected by the head;

position control means for generating a position control means corresponding to the position error signal;

disturbance estimation means for estimating a magnitude of a disturbance applied to the head from the position control signal and the voltage signal, and for generating a disturbance estimation signal;

correction means for combining the position control signal with the disturbance estimation signal to generate the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal; and

addition means for adding a signal obtained by multiplying an integral signal, obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and for generating the disturbance estimation signal.

10. (Withdrawn) The disk drive according to claim 9, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage detection means;

first multiplication means for multiplying the position control signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

11. (Withdrawn) The disk drive according to any one of claims 1 to 9 , wherein a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$ where ω_o is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

12. (Withdrawn) The disk drive according to claim 9, wherein the first coefficient is set at 1.

13. (Withdrawn) The disk drive according to claim 9, wherein a control band of the disturbance estimation means is set wider than a control band of the position control means.

14. (Withdrawn) A disk drive comprising:

actuator means for positioning a head relative to a disk;

driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;

position detection means for generating a position error signal corresponding to a current position of the head from servo information recorded on the disk in advance and detected by the head;

position control means for generating a position control means corresponding to the position error signal;

disturbance estimation means for estimating a magnitude of a disturbance applied to the head from the position control signal and the voltage signal, and for generating a disturbance estimation signal;

correction means for combining the position control signal with the disturbance estimation signal to generate the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal;

filter means for cutting off a high frequency component of a proportional signal proportional to the deviation signal, and for generating a filter output signal; and

addition means for adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal

obtained by multiplying the filter output signal by a second coefficient, and for generating the disturbance estimation signal.

15. (Withdrawn) The disk drive according to claim 14, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage detection means;

first multiplication means for multiplying the position control signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

16. (Withdrawn) The disk drive according to claim 14, wherein

a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$, where ω_o^2 is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

17. (Withdrawn) The disk drive according to claim 14, wherein the first coefficient is set at 1.

18. (Withdrawn) The disk drive according to claim 14, wherein a control band of the disturbance estimation means is set wider than a control band of the position control means.

19. (Original) A disk drive control method comprising the steps of:
 generating a position error signal corresponding to a current position of a head from servo information recorded on a disk in advance and detected by the head;
 generating a position control signal corresponding to the position error signal;
 generating a voltage estimation signal that is an estimate of a voltage signal, which is generated when driving actuator means for positioning the head, based on a driving signal for the actuator means and the voltage signal;
 comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;
 adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying

a proportional signal proportional to the deviation signal by a second coefficient, and
thereby generating a disturbance estimation signal;

combining the position control signal and the disturbance estimation signal, and
generating the driving signal; and

driving the actuator means by the driving signal, and positioning the head relative
to the disk.

20. (Original) The disk drive control method according to claim 19, wherein
a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to
substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$ where ω_o is an estimation frequency of the
disturbance estimation means and ω_d is a disturbance frequency.

21. (Original) The disk drive control method according to claim 19, wherein
a control band of the disturbance estimation is set wider than a control band of
the position control.

22. (Currently Amended) ~~[[A]]~~ The disk drive control method according to claim 19
further comprising the ~~[[steps]]~~ step of:

~~generating a position error signal corresponding to a current position of a head
from servo information recorded on a disk in advance and detected by the head;~~

~~generating a position control signal corresponding to the position error signal;~~

~~generating a voltage estimation signal that is an estimate of a voltage signal,
which is generated when driving actuator means for positioning the head, based on a
driving signal for the actuator means and the voltage signal;~~

~~comparing the voltage estimation signal with the voltage signal, and generating a
deviation signal which indicates a difference between the voltage estimation signal and
the voltage signal;~~

adding a signal obtained by multiplying an integral signal, which is obtained by
integrating the deviation signal, by a first coefficient and a signal obtained by multiplying
a filter output signal obtained by cutting off a high frequency component of a
proportional signal proportional to the deviation signal by a second coefficient, and
thereby generating ~~[[a]]~~ the disturbance estimation signal;

combining the position control signal and the disturbance estimation signal, and
generating the driving signal; and

driving the actuator means by the driving signal, and positioning the head relative
to the disk.

23. (Original) The disk drive control method according to claim 22, wherein
a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to
substantially satisfy $\omega_0^2/(\omega_0^2 - \omega_d^2)$, where ω_0 is an estimation frequency of the
disturbance estimation means and ω_d is a disturbance frequency.

24. (Original) The disk drive control method according to claim 22, wherein

a control band of the disturbance estimation is set wider than a control band of the position control.

25. (Withdrawn) A disk drive control method comprising the steps of:

generating a position error signal corresponding to a current position of a head from servo information recorded on a disk in advance and detected by the head;

generating a position control signal corresponding to the position error signal;

generating a voltage estimation signal that is an estimate of a voltage signal, which is generated when driving actuator means, based on the position control signal and the voltage signal;

comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;

adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the position control signal and the disturbance estimation signal, and generating the driving signal; and driving the actuator means by the driving signal, and positioning the head relative to the disk.

26. (Withdrawn) The disk drive control method according to claim 25, wherein

a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$, where ω_o is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

27. (Withdrawn) The disk drive control method according to claim 25, wherein the first coefficient is set at 1.

28. (Withdrawn) The disk drive control method according to claim 25, wherein a control band of the disturbance estimation is set wider than a control band of the position control.

29. (Withdrawn) A disk drive control method comprising the steps of:

- generating a position error signal corresponding to a current position of a head from servo information recorded on a disk in advance and detected by the head;
- generating a position control signal corresponding to the position error signal;
- generating a voltage estimation signal that is an estimate of a voltage signal, which is generated when driving actuator means, based on the position control signal and the voltage signal;
- comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;
- adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by

multiplying a filter output signal obtained by cutting off a high frequency component of a proportional signal proportional to the deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the position control signal and the disturbance estimation signal, and generating the driving signal; and

driving the actuator means by the driving signal, and positioning the head relative to the disk.

30. (Withdrawn) The disk drive control method according to claim 29, wherein a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$ where ω_o is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

31. (Withdrawn) The disk drive control method according to claim 29, wherein the first coefficient is set at 1.

32. (Withdrawn) The disk drive control method according to claim 29, wherein a control band of the disturbance estimation is set wider than a control band of the position control.

33. (Withdrawn) A disk drive comprising:
actuator means for loading and unloading a head to and from a disk;
driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;

disturbance estimation means for estimating a magnitude of a disturbance applied to the head from a driving signal for the driving means and the voltage signal, and for generating a disturbance estimation signal;

velocity control means for generating a velocity control signal from a velocity instruction signal and the voltage signal ; and

correction means for combining the velocity control signal and the disturbance estimation signal, and for thereby generating the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal; and

addition means for adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and for generating the disturbance estimation signal.

34. (Withdrawn) The disk drive according to claim 33, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal output from the voltage detection means;

first multiplication means for multiplying the driving signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, which is obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

35. (Withdrawn) The disk drive according to claim 33, wherein

a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$, where ω_d is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

36. (Withdrawn) The disk drive according to claim 33, wherein

the velocity control means generates the velocity control means from the velocity instruction signal and a velocity estimation signal generated by the disturbance estimation means.

37. (Withdrawn) The disk drive according to claim 33, wherein
a control band of the disturbance estimation means is set wider than a control
band of the velocity control means.
38. (Withdrawn) A disk drive comprising:
actuator means for loading and unloading a head to and from a disk;
driving means for driving the actuator means;
voltage detection means for detecting a voltage generated when driving the
actuator means, and for outputting a voltage signal;
disturbance estimation means for estimating a magnitude of a disturbance
applied to the head from a driving signal for the driving means and the voltage signal,
and for generating a disturbance estimation signal;
velocity control means for generating a velocity control signal from a velocity
instruction signal and the voltage signal ; and
correction means for combining the velocity control signal and the disturbance
estimation signal, and for thereby generating the driving signal, wherein
the disturbance estimation means comprises:
comparison means for comparing the disturbance estimation signal generated by
the disturbance estimation means with the voltage signal, and for outputting a deviation
signal;
filter means for cutting off a high frequency component of a proportional signal
proportional to the deviation signal, and for generating a filter output signal; and

addition means for adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying the filter output signal by a second coefficient, and for generating the disturbance estimation signal.

39. (Withdrawn) The disk drive according to claim 38, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage detection means;

first multiplication means for multiplying the driving signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, which is obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

40. (Withdrawn) The disk drive according to claim 38, wherein
a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$, where ω_o is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.
41. (Withdrawn) The disk drive according to claim 38, wherein
the velocity control means generates the velocity control means from the velocity instruction signal and a velocity estimation signal generated by the disturbance estimation means.
42. (Withdrawn) The disk drive according to claim 38, wherein
a control band of the disturbance estimation means is set wider than a control band of the velocity control means.
43. (Withdrawn) A disk drive comprising:
actuator means for loading and unloading a head to and from a disk;
driving means for driving the actuator means;
voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;
disturbance estimation means for estimating a magnitude of a disturbance applied to the head from a velocity control signal and the voltage signal, and for generating a disturbance estimation signal;

velocity control means for generating a velocity control signal from a velocity instruction signal and the voltage signal; and

correction means for combining the velocity control signal and the disturbance estimation signal, and for thereby generating the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal; and

addition means for adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and for generating the disturbance estimation signal.

44. (Withdrawn) The disk drive according to claim 43, wherein the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage detection means;

first multiplication means for multiplying the position control signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, which is obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

45. (Withdrawn) The disk drive according to claim 43, wherein

a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$, where ω_o is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

46. (Withdrawn) The disk drive according to claim 43, wherein

the first coefficient is set at 1.

47. (Withdrawn) The disk drive according to claim 43, wherein

the velocity control means generates the velocity control means from the velocity instruction signal and a velocity estimation signal generated by the disturbance estimation means.

48. (Withdrawn) The disk drive according to claim 43, wherein a control band of the disturbance estimation means is set wider than a control band of the velocity control means.

49. (Withdrawn) A disk drive comprising:

actuator means for loading and unloading a head to and from a disk;

driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;

disturbance estimation means for estimating a magnitude of a disturbance applied to the head from a velocity control signal and the voltage signal, and for generating a disturbance estimation signal;

velocity control means for generating a velocity control signal from a velocity instruction signal and the voltage signal; and

correction means for combining the velocity control signal and the disturbance estimation signal, and for thereby generating the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal;

filter means for cutting off a high frequency component of a proportional signal proportional to the deviation signal, and for generating a filter output signal; and

addition means for adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying the filter output signal by a second coefficient, and for generating the disturbance estimation signal.

50. (Withdrawn) The disk drive according to claim 49, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal output from the voltage detection means;

first multiplication means for multiplying the position control signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, which is obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

51. (Withdrawn) The disk drive according to claim 49, wherein
a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$, where ω_o is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.
52. (Withdrawn) The disk drive according to claim 49, wherein
the first coefficient is set at 1.
53. (Withdrawn) The disk drive according to claim 49, wherein
the velocity control means generates the velocity control means from the velocity instruction signal and a velocity estimation signal generated by the disturbance estimation means.
54. (Withdrawn) The disk drive according to claim 49, wherein
a control band of the disturbance estimation means is set wider than a control band of the velocity control means.
55. (Withdrawn) A disk drive control method comprising the steps of:
generating a velocity control signal corresponding to a velocity instruction;
generating a voltage estimation signal that is an estimate of a voltage signal,
which is generated when driving actuator means for loading and unloading a head,
based on a driving signal for the actuator means and the voltage signal;

comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;

adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the velocity control signal and the disturbance estimation signal, and generating the driving signal; and

driving the actuator means by the driving signal, and loading and unloading the head to and from the disk.

56. (Withdrawn) The disk drive control method according to claim 55, wherein a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$, where ω_o is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

57. (Withdrawn) The disk drive control method according to claim 55, wherein a control band of the disturbance estimation is set wider than a control band of the position control.

58. (Withdrawn) A disk drive control method comprising the steps of:
generating a velocity control signal corresponding to a velocity instruction;

generating a voltage estimation signal that is an estimate of a voltage signal, which is generated when driving actuator means for loading and unloading a head, based on a driving signal for the actuator means and the voltage signal;

comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;

adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a filter output signal obtained by cutting of a high frequency component of a proportional signal proportional to the deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the velocity control signal and the disturbance estimation signal, and generating the driving signal; and

driving the actuator means by the driving signal, and loading and unloading the head to and from the disk.

59. (Withdrawn) The disk drive control method according to claim 58, wherein a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$, where ω_o is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

60. (Withdrawn) The disk drive control method according to claim 58, wherein

a control band of the disturbance estimation is set wider than a control band of the position control.

61. (Withdrawn) A disk drive control method comprising the steps of:

generating a velocity control signal corresponding to a velocity instruction;
generating a voltage estimation signal that is an estimate of a voltage signal, which is generated when driving actuator means, based on the velocity control signal and the voltage signal;

comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;

adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the velocity control signal and the disturbance estimation signal, and generating the driving signal; and

driving the actuator means by the driving signal, and loading and unloading the head to and from the disk.

62. (Withdrawn) The disk drive control method according to claim 61, wherein

a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$, where ω_o is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

63. (Withdrawn) The disk drive control method according to claim 61, wherein the first coefficient is set at 1.

64. (Withdrawn) The disk drive control method according to claim 61, wherein a control band of the disturbance estimation is set wider than a control band of the position control.

65. (Withdrawn) A disk drive control method comprising the steps of:
 generating a velocity control signal corresponding to a velocity instruction;
 generating a voltage estimation signal that is an estimate of a voltage signal, which is generated when driving actuator means for loading and unloading a head, based on the velocity control signal and the voltage signal;
 comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;
 adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a filter output signal obtained by cutting off a high frequency component of a proportional signal proportional to the

deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the velocity control signal and the disturbance estimation signal, and generating the driving signal; and

driving the actuator means by the driving signal, and loading and unloading the head to and from the disk.

66. (Withdrawn) The disk drive control method according to claim 65, wherein a ratio k_2/k_1 of the first coefficient k_1 and the second coefficient k_2 is set to substantially satisfy $\omega_o^2/(\omega_o^2 - \omega_d^2)$, where ω_o is an estimation frequency of the disturbance estimation means and ω_d is a disturbance frequency.

67. (Withdrawn) The disk drive control method according to claim 65, wherein the first coefficient is set at 1.

68. (Withdrawn) The disk drive control method according to claim 65, wherein a control band of the disturbance estimation is set wider than a control band of the position control.